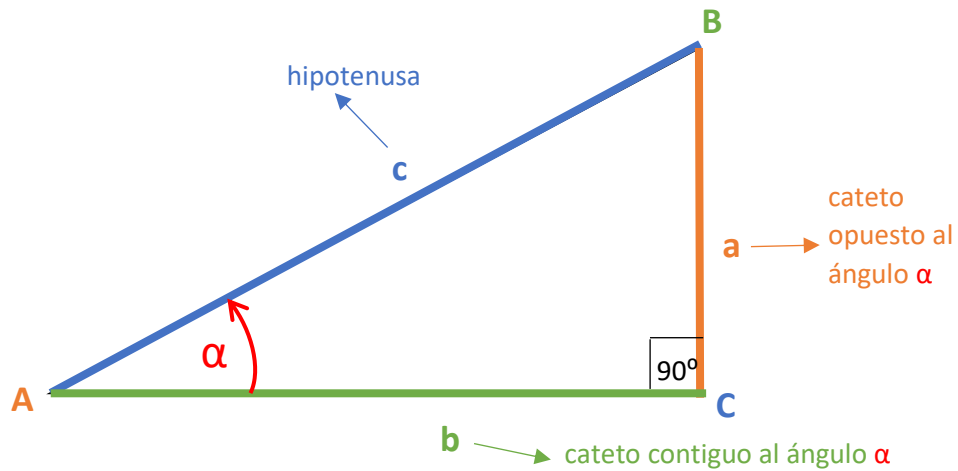


# Apuntes de trigonometría básica

Dra. Silvia Alonso Pérez



Tenemos un triángulo rectángulo de vértices A, B y C, con el ángulo recto =  $90^\circ$  en C, y lados de longitud a, b y c. Las funciones trigonométricas del ángulo  $\alpha$  son las siguientes:

$$\text{sen } \alpha = \frac{a}{c} = \frac{\text{cateto opuesto}}{\text{hipotenusa}} \longrightarrow \text{Seno}$$

$$\text{cos } \alpha = \frac{b}{c} = \frac{\text{cateto adyacente}}{\text{hipotenusa}} \longrightarrow \text{Coseno}$$

$$\text{tg } \alpha = \frac{a}{b} = \frac{\text{cateto opuesto}}{\text{cateto adyacente}} \longrightarrow \text{Tangente}$$

$$\text{cotg } \alpha = \frac{b}{a} = \frac{1}{\text{tg } \alpha} = \frac{\text{cateto adyacente}}{\text{cateto opuesto}} \longrightarrow \text{Cotangente}$$

$$\text{sec } \alpha = \frac{c}{b} = \frac{1}{\text{cos } \alpha} = \frac{\text{hipotenusa}}{\text{cateto adyacente}} \longrightarrow \text{Secante}$$

$$\text{cosec } \alpha = \frac{c}{a} = \frac{1}{\text{sen } \alpha} = \frac{\text{hipotenusa}}{\text{cateto opuesto}} \longrightarrow \text{Cosecante}$$

## Relaciones trigonométricas

$$\operatorname{tg} \alpha = \frac{\operatorname{sen} \alpha}{\operatorname{cos} \alpha}$$

$$\operatorname{cotg} \alpha = \frac{1}{\operatorname{tg} \alpha} = \frac{\operatorname{cos} \alpha}{\operatorname{sen} \alpha}$$

$$\operatorname{sec} \alpha = \frac{1}{\operatorname{cos} \alpha}$$

$$\operatorname{cosec} \alpha = \frac{1}{\operatorname{sen} \alpha}$$

$$\operatorname{sen}^2 \alpha + \operatorname{cos}^2 \alpha = 1$$

$$\operatorname{sec}^2 \alpha - \operatorname{tg}^2 \alpha = 1$$

$$\operatorname{cosec}^2 \alpha - \operatorname{cotg}^2 \alpha = 1$$

$$\operatorname{sen}(-\alpha) = -\operatorname{sen} \alpha$$

$$\operatorname{cos}(-\alpha) = \operatorname{cos} \alpha$$

$$\operatorname{tg}(-\alpha) = -\operatorname{tg} \alpha$$

$$\operatorname{cosec}(-\alpha) = -\operatorname{cosec} \alpha$$

$$\operatorname{sec}(-\alpha) = \operatorname{sec} \alpha$$

$$\operatorname{cotg}(-\alpha) = -\operatorname{cotg} \alpha$$

$$\operatorname{sen}(\alpha \pm \beta) = \operatorname{sen} \alpha \cdot \operatorname{cos} \beta \pm \operatorname{cos} \alpha \cdot \operatorname{sen} \beta$$

$$\operatorname{cos}(\alpha \pm \beta) = \operatorname{cos} \alpha \cdot \operatorname{cos} \beta \mp \operatorname{sen} \alpha \cdot \operatorname{sen} \beta$$

$$\operatorname{tg}(\alpha \pm \beta) = \frac{\operatorname{tg} \alpha \pm \operatorname{tg} \beta}{1 \mp \operatorname{tg} \alpha \cdot \operatorname{tg} \beta}$$

$$\operatorname{cotg}(\alpha \pm \beta) = \frac{\operatorname{cotg} \alpha \cdot \operatorname{cotg} \beta \mp 1}{\operatorname{cotg} \alpha \pm \operatorname{cotg} \beta}$$

$$1 \text{ radián} = 180^\circ/\pi$$

$$1^\circ = \pi/180 \text{ radianes}$$